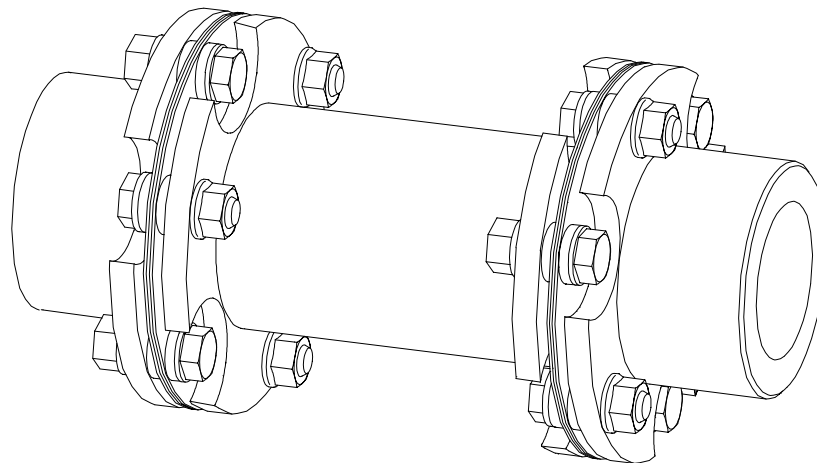


# Operating Instructions

**BA 8700 EN 08.95**

for **ARPEX®** All Steel Couplings of all types  
Series **K430**  
Sizes 80 to 820



# FLENDER

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## Manufacturer's Declaration

according to the meaning of the EU directive 98/37/EG appendix II B


Herewith we declare, that the

**ARPEX<sup>®</sup> All Steel Couplings,**  
**Series K430, Sizes 80 - 820**

described in these operating instructions, are intended for incorporation into a machine and that their use is prohibited until it has been established that the machine, into which these components have been incorporated, corresponds with the EU directive (original version 98/37/EG incl. further amendments).

With this manufacturer's declaration, all coordinated standards are taken into account, in as far as they apply to our products, which are published by the EU commission in the gazette of the European Union.

Bocholt, 22.08.1995

  
\_\_\_\_\_  
Signature (Engineering)

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## 1. Technical data

The following lists of technical data contain the most important details of the coupling. These data and the contractual agreement for the coupling determine the limits of its use according to the terms of the contract.

The nominal torques  $T_{KN}$  shown in the following lists are valid for:

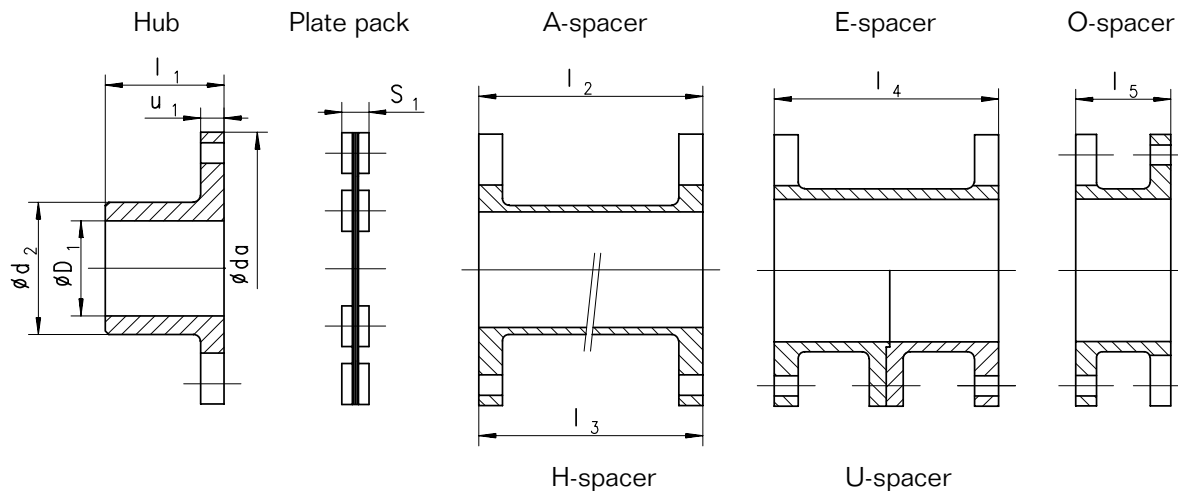
- Continuous operation up to 24 h
- Shock loads of up to twice the nominal torque are allowed up to five times per hour on starting or during operation.
- Operation within the stipulated alignment
- Operation within a temperature range from -20 °C up to +280 °C (ambient temperature resp. shaft end temperatures)

### **Attention !**

**In order to ensure continuous, trouble-free operation, the coupling has to be selected with a service factor, adequate to the application. In case of changes in operating conditions (power rating, speed, changes on driver or driven machine) re-examination of the design is urgently necessary.**

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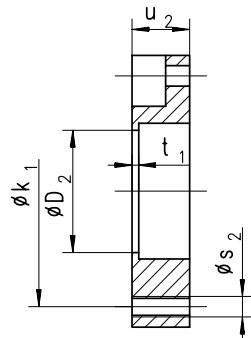
## 1.1. Dimensions of ARPEX components



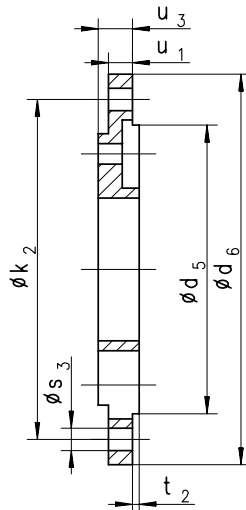
ARPEX-coupling da Size	Nominal Torque $T_{KN}$ Nm	Speed $n_{max}$ rpm	Bore $D_1$ max. mm	$D_2$ H7 mm	$d_2$ mm	$d_5$ mm	$d_6$ mm	$k_1$ mm	$k_2$ mm	$l_1$ mm	$l_2$ mm
80	30	10700	28	40	39	85	115	68	100	35	84/124
92	50	9300	38	50	53	100	127	80	112	40	84/124
102	100	8400	45	60	63	110	137	90	122	45	84/124
128	200	6700	55	70	77	135	178	112	158	55	78/118/158
145	400	5900	65	80	91	150	195	128	175	65	78/118/158
168	630	5100	75	90	105	175	240	148	210	75	72/112/152/222
180	1000	4750	80	90	112	185	250	158	220	80	70/110/150/220
200	1600	4300	85	100	120	205	270	170	240	80	110/150/220
205	2000	4200	85	100	120	210	275	175	245	80	100/140/210
215	2500	4000	90	110	128	220	300	185	265	90	100/140/210
235	3200	3650	95	120	132	240	320	199	285	100	134/204
250	4000	3400	100	125	145	260	335	214	300	100	134/204
270	5000	3200	110	130	155	280	355	234	320	110	134/204
300	6300	2850	115	150	162	310	395	250	350	115	126/196
320	8000	2700	125	160	176	330	415	270	370	125	126/196
350	10000	2450	130	180	186	360	445	290	400	140	-
370	12500	2300	145	190	203	380	480	310	430	145	-
400	16000	2150	165	200	230	410	510	340	460	165	-
440	21000	1950	175	220	245	450	580	370	520	175	-
460	24000	1850	185	230	260	470	600	390	540	185	-
480	27500	1800	200	240	280	490	620	410	560	200	-
500	31500	1700	210	250	295	510	640	430	580	210	-
520	36000	1650	215	260	298	530	660	440	600	215	-
540	40000	1600	220	270	310	550	690	460	620	220	-
560	46000	1550	230	280	325	570	710	480	640	230	-
600	53000	1450	240	300	335	610	750	505	680	240	-
620	61000	1400	250	310	350	630	770	525	700	255	-
660	70000	1300	275	330	385	670	810	565	740	275	-
690	80000	1250	285	350	400	700	850	595	770	285	-
720	91000	1200	295	360	410	730	870	610	800	295	-
740	103000	1150	300	370	420	750	890	630	820	300	-
770	118000	1100	320	380	450	780	920	660	850	320	-
820	135000	1050	350	400	490	830	970	710	900	350	-

Table 1.1.1: Torques  $T_{KN}$ , speed  $n_{max}$ , dimensions of ARPEX components

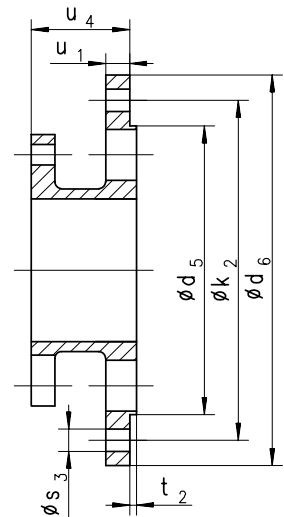
C-flange



F-flange



D-flange



ARPEX-coupling da Size	I <sub>3</sub> mm	I <sub>4</sub> mm	I <sub>5</sub> mm	S <sub>1</sub> mm	Thread. holes		Clearance holes		t <sub>1</sub> mm	t <sub>2</sub> mm	u <sub>1</sub> mm	u <sub>2</sub> mm	u <sub>3</sub> mm	u <sub>4</sub> mm
					s <sub>2</sub> mm	no.	s <sub>3</sub> mm	no.						
80	acc. to customer's specification	44		8	M 6	6	6,6	6	4	2	7	17	10	29
92		54	28	8	M 6	6	6,6	6	4	2	7	17	10	29
102		64	33	8	M 6	6	6,6	6	4	2	7	17	10	29
128		74	38	11	M 8	6	9	8	4	2	9	21	13	38
145		94	48	11	M 8	6	9	8	4	2	9	21	13	38
168		108	55	14	M 10	6	14	12	4	2	9	24	15	43
180		110	56	15	M 12	6	14	12	4	2	12	30	19	54
200		110	56	15	M 16	6	14	12	4	2	13	35	22	66
205		100	51	20	M 16	6	14	12	4	2	13	35	22	66
215		120	61	20	M 16	6	18	12	4	2	13	35	22	66
235		124	63	23	M 20	6	18	12	4	2	18	46	30	86
250		124	63	23	M 20	6	18	12	4	2	18	46	30	86
270		144	73	23	M 20	6	18	12	4	2	18	46	30	86
300		146	74	27	M 24	6	22	12	6	3	20	55	33	100
320		166	84	27	M 24	6	22	12	6	3	20	55	33	100
350		176	89	32	M 30	6	22	12	6	3	25	70	42	125
370		186	94	32	M 30	6	26	12	6	3	25	70	42	125
400		226	114	32	M 30	6	26	12	6	3	25	70	42	125
440		224	114	38	M 36	6	33	12	6	3	30	80	51	146
460		244	124	38	M 36	6	33	12	6	3	30	80	51	146
480		274	139	38	M 36	6	33	12	6	3	30	80	51	146
500		294	149	38	M 36	6	33	12	6	3	30	80	51	146
520		282	143	44	M 42	6	33	12	8	4	36	90	59	167
540		292	148	44	M 42	6	39	16	8	4	36	90	59	167
560		312	158	44	M 42	6	39	16	8	4	36	90	59	167
600		310	157	50	M 48	6	39	16	8	4	41	105	68	193
620		340	172	50	M 48	6	39	16	8	4	41	105	68	193
660		380	192	50	M 48	6	39	16	8	4	41	105	68	193
690		400	202	50	M 48	6	39	16	8	4	41	105	68	193
720		390	197	60	M 56	6	39	16	8	4	46	120	78	223
740		400	202	60	M 56	6	39	24	8	4	46	120	78	223
770		440	222	60	M 56	6	39	24	8	4	46	120	78	223
820		500	252	60	M 56	6	39	24	8	4	46	120	78	223

Table 1.1.2: Dimensions of ARPEX components

## 1.2 Weights of ARPEX components

Size da mm	Weights					
	Hub	Plate pack	A-spacer		H-spacer	
	kg	kg	I2 mm	kg	I3 = 1000 mm kg	per 100 mm tube kg
<b>80</b>	0,36	0,13	84	0,42	1,7	0,14
			124	0,47		
<b>92</b>	0,64	0,14	84	0,72	4,4	0,41
			124	0,88		
<b>102</b>	0,95	0,15	84	0,89	4,6	0,41
			124	1,0		
<b>128</b>	1,9	0,37	78	1,5	8,8	0,8
			118	1,8		
			158	2,1		
<b>145</b>	3,0	0,41	78	2,0	9,2	0,8
			118	2,3		
			158	2,7		
<b>168</b>	4,4	0,77	72	2,4	13,5	1,2
			112	2,9		
			152	3,3		
			222	4,2		
<b>180</b>	5,7	1,1	70	3,5	14,5	1,2
			110	4,0		
			150	4,4		
			220	5,3		
<b>200</b>	6,7	1,9	110	5,3	22,0	1,9
			150	6,1		
			220	7,4		
<b>205</b>	6,9	2,6	100	5,4	22,5	1,9
			140	6,2		
			210	7,5		
<b>215</b>	8,4	2,6	100	5,8	25,0	2,1
			140	6,7		
			210	8,2		
<b>235</b>	10,5	3,8	134	9,1	27,5	2,1
			204	10,5		
<b>250</b>	13	3,8	134	10,5	33	2,6
			204	12,5		
<b>270</b>	16	4,0	134	13,0	35	2,6
			204	15,0		
<b>300</b>	19	7,0	126	17,5	58	4,7
			196	20,5		
<b>320</b>	24	7,1	126	20,5	61	4,7
			196	23,5		
<b>350</b>	31	12,5	-	-	68	4,7
<b>370</b>	36	13,0	-	-	91	7,2
<b>400</b>	50	13,5	-	-	98	7,2
<b>440</b>	64	21,5	-	-	115	7,2
<b>460</b>	75	21,5	-	-	130	8,9
<b>480</b>	88	22,0	-	-	135	8,9
<b>500</b>	105	22,5	-	-	140	8,9
<b>520</b>	115	34,0	-	-	175	11,0
<b>540</b>	120	34,0	-	-	185	11,0
<b>560</b>	140	35,0	-	-	195	11,0
<b>600</b>	165	53,0	-	-	240	14,5
<b>620</b>	180	53,0	-	-	255	14,5
<b>660</b>	225	55,0	-	-	280	14,5
<b>690</b>	255	56,0	-	-	320	19,0
<b>720</b>	275	84,0	-	-	360	19,0
<b>740</b>	295	85,0	-	-	370	19,0
<b>770</b>	350	86,0	-	-	400	21,5
<b>820</b>	430	88,0	-	-	450	21,5

Table 1.1.3: Weights of ARPEX components



Size da mm	Weights					
	E-spacer	U-spacer	O-spacer	C-flange	F-flange	D-flange
	kg	kg	kg	kg	kg	kg
80	0,32	-	-	0,21	0,52	0,71
92	0,46	-	0,35	0,33	0,65	0,85
102	0,65	-	0,47	0,42	0,74	0,98
128	1,2	-	1,0	1,1	1,9	2,1
145	1,7	2,5	1,3	1,5	2,3	2,4
168	2,4	3,4	1,8	2,2	3,2	3,6
180	3,2	4,5	2,6	3,4	4,6	5,2
200	4,2	5,8	3,3	4,4	5,8	6,8
205	4,3	6,1	3,5	4,8	6,2	7,2
215	5,0	6,9	4,0	5,3	7,2	8,2
235	7,5	9,8	6,1	7,3	10,5	13,0
250	8,5	11,5	7,0	9,0	12,5	14,5
270	10,0	14,5	8,2	11,5	14,5	16,0
300	14,0	20,0	11,5	15,0	19,0	23,0
320	16,5	23,0	13,5	18,0	21,5	25,0
350	24,0	32,0	19,5	23,0	28,5	38,0
370	27,5	37,0	22,5	27,5	34,0	43,0
400	35,0	43,0	27,5	36,0	40,0	48,0
440	47	61	39	50	63	73
460	52	64	43	57	69	78
480	57	73	47	64	74	82
500	69	82	54	71	80	89
520	84	100	67	81	97	115
540	92	105	73	89	105	125
560	100	130	80	99	110	130
600	125	155	105	130	140	175
620	150	190	120	145	150	190
660	175	210	135	170	170	205
690	205	260	160	185	190	230
720	250	300	190	220	225	285
740	275	330	205	240	240	295
770	310	350	225	270	260	310
820	360	430	265	310	295	340

Table 1.1.4: Weights of ARPEX components

## **2. General information**

### **2.1 General**

These operating instructions should always be kept accessible near the coupling.

Only exact knowledge of the operating instructions ensures trouble-free coupling operation. Therefore, it is in the interest of our customers that these instructions are read, understood and in all aspects observed by personnel responsible for transport, assembly and operation.

**Note:** We cannot be held responsible for damages and operating hold-ups, resulting from failure to comply with the operating instructions.

The "coupling" dealt with in these instructions, has been designed for stationary applications in general mechanical engineering.

Possible applications for couplings of this series are e.g. waste water treatment, dredgers, chemical industry, printing machines, iron and steel industry, conveyors, hoisting equipment, food industry, paper machines, pumps, cable railways, ventilators, compressors, cement industry etc.

The coupling is designed only for the application range stated in section 1 "Technical data". Deviating operating conditions necessitate a new contractual agreement.

The coupling described herein, corresponds to the state of technology at the time of going to press.

In the interest of further development, whilst maintaining the essential characteristics, we reserve the right to make changes, which are deemed to increase its capacity and safety.

The copyright on these operating instructions remains with FLENDER GMBH.

Reproductions whole or in part, without our permission, are not permitted: it must not be used for the purpose of unauthorised competition or made available to third parties.

Please refer all technical queries to the factory

**FLENDER GMBH**  
**46393 Bocholt**

**Tel. : 02871/92-0**  
**Fax. : 02871/92-2596**  
**Telex: 813841**

**Internet: <http://www.flender.com>**

or to one of our service centers. A list of centers can be found in section 11 "Stocking of spare parts, addresses of service centres"

## 3. Safety information

### 3.1 Safety notes for the user

- The coupling has been designed according to the state of technology and is supplied in a safe to operate condition. Unauthorized modification, which interfere with the operational safety are not permitted. This applies also to guarding devices, which have been put up against unintentional contact.
- The coupling is to be installed and operated only within the scope of conditions laid down in the supply contract.
- The customer has to ensure that all personnel engaged in assembly, operation, care and maintenance, have read and understood these operating instructions and that they strictly observe all points to:
  - avert danger to life and limb of users and third parties,
  - safeguard the operational safety of the couplingand
  - exclude downtime and environmental damage through wrong handling.
- The relevant regulations and instructions concerning health and safety at work, and environment protection have to be observed for transport, assembly and disassembly, operation and maintenance.
- The coupling is to be operated and maintained only by authorised and trained personnel.
- All work has to be carried out carefully and from the point of view of "safety".
- Any work on the coupling has to be carried out whilst it is at rest. The driver is to be safeguarded against unintentional starting (e.g. by locking the key switch or removing fuses in the mains supply). A notice should be placed at the start-up location which says that work is being carried out on the coupling.
- The driver is to be switched off at once, if, during operation, any changes such as changed running noise, can be noticed on the coupling.
- The coupling is to be protected by appropriate protecting guards against accidental touching.
- When the coupling is incorporated in machines or equipment, the manufacturer of the machine or equipment is obliged to include all instructions, notes and descriptions of this operating instructions in his operating instructions.

#### 3.1.1 Marking of safety notes in the operating instructions

Any important instructions which refer to safety and operational protection, have been marked by:



This symbol points to safety measures, which must be followed to avoid **personal injuries**.



This symbol refers to safety measures which must be observed to avoid **damage to the coupling**.

#### **Note!**

This note refers to **general operating instructions**, which should be specially noted.

## 4. Transport and storage

### 4.1 Extent of supply

The extent of supply is listed on the transport documents. Its completeness should be checked on delivery. Possible transport damage and/or missing parts should be reported immediately in writing. After consultation with Messrs. Flender an expert should be called in.

### 4.2 Transport

Subject to transport route and size, the coupling is packed differently. If not specially agreed in the contract, the packing corresponds to guide lines HPE. Symbols on the packaging should be noted. They have the following meaning:



Top



Fragile



Keep dry



Sensitive  
to heat



Centre of  
gravity



Do not use  
hook



Secure  
here

**Attention !**

**Make sure to use suitable lifting gear.**

### 4.3 Storage

#### 4.3.1 Storage of coupling parts

The coupling is supplied with a protective coating and can be stored for up to 6 months, indoors at a dry location. In case longer storage is intended, a corresponding long-term conservation is necessary (refer to FLENDER GMBH).

#### 4.3.2 Storage of plate packs

##### 4.3.2.1 General information

Properly stored plate packs remain unchanged in their characteristics. Storage under unfavourable conditions and improper handling will have a negative influence and a change of physical properties will result. These changes can come about through reaction to oxygen, ozone, extreme temperatures or damp.

##### 4.3.2.2 Store

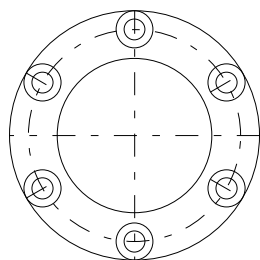
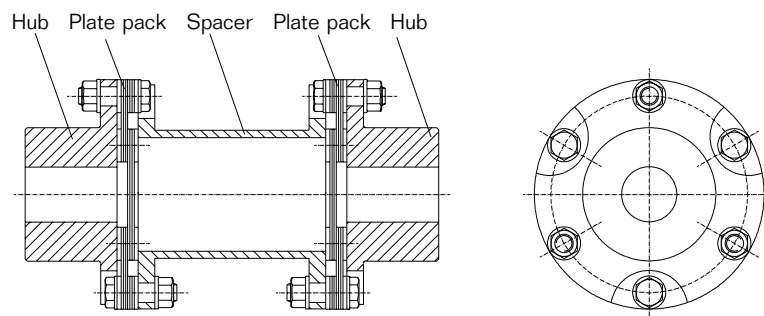
The storage place should be dry and dust-free. The plate packs are not to be stored together with corrosive chemicals, acids, alkaline solutions etc.

**Attention !**

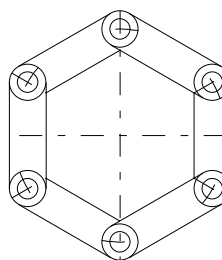
**Damp storage places are unsuitable. Care should be taken that no condensation develops. The relative humidity is most favourable below 65%.**

## 5. Technical specification

### 5.1 General description



**Ring plate pack**



**Hexagon plate pack**

ARPEX couplings are all steel couplings. The plate packs are placed between flanges of coupling parts and spacer and alternately bolted with them.

Individual thin steel plates are assembled on bushings and are pressed tightly together by an inserted, internally bevelled, retaining ring. The retaining ring is fastened by the expanded end of the bushing, which fits snugly against it. As all joints are built-up like this, the plate pack forms a compact unit.

By this arrangement of plate packs, the ARPEX coupling is torsionally stiff and torque is transmitted without backlash.

ARPEX couplings of standard series size 80 to 200 have ring-plate packs, sizes 205 up to 820 are supplied with hexagon plate packs (see illustration). Collar bolts with collar nuts, up to size 145 with Cleveloc-nuts, connect plate packs with spacer- and coupling part flanges.

By virtue of the modular design concept, ARPEX couplings can be assembled almost at random.

The size identification of the coupling is on the outside diameter ( $d_a$ ) of coupling flange in mm. This identification is complemented by a preceding combination of letters, which specify the coupling components.

**Example:** NHN 250  
Coupling with two hubs (N) and one spacer (H) size 250

## 6. Assembly

### 6.1 Information on machining finish bores, axial safeguarding, set screws, balancing

#### 6.1.1 Finish bores

- Remove rust preventive coating from coupling parts.



**Observe manufacturer's instructions regarding handling of solvents.**

In order to machine finish bores components have to be carefully aligned. Limits for concentric and offset misalignment are listed in table 6.1. Parts have to be held at the planes marked thus (A).

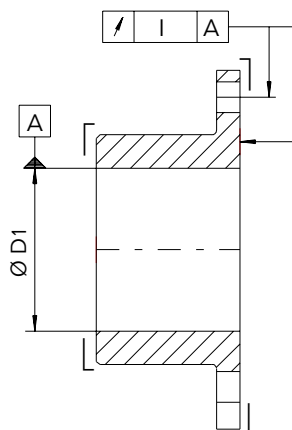
#### **Attention !**

**The max. permissible bore diameters apply to drive type fastenings without taper action according to DIN 6885/1 and must not be exceeded under any circumstances.**

If instead of the planned drive type fastening other shaft- hub connections (e.g. splined hub profiles, tapered or stepped bores, stressed type fastenings with taper action) are to be used, consult FLENDER GMBH.



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**



Size	Bore D1 mm	Concentr. I mm	Size	Bore D1 mm	Concentr. I mm	Size	Bore D1 mm	Concentr. I mm
80	28	0,030	250	100	0,046	520	215	0,07
92	38	0,035	270	110	0,052	540	220	0,07
102	45	0,035	300	115	0,052	560	230	0,07
128	55	0,040	320	125	0,057	600	240	0,07
145	65	0,040	350	130	0,057	620	250	0,07
168	75	0,040	370	145	0,057	660	275	0,08
180	80	0,040	400	165	0,057	690	285	0,08
200	85	0,046	440	175	0,063	720	295	0,08
205	85	0,046	460	185	0,063	740	300	0,08
215	90	0,046	480	200	0,063	770	320	0,08
235	95	0,046	500	210	0,063	820	350	0,09

Table 6.1: Permissible radial and offset misalignment

For drive connections by keys, the following combination of fits are specified:

Type of fit	Shaft limits	Bore limits	
		Reversing operation	One-direction operation
Interference fit with keyway	h6	P7	N7
	k6	M7	H7
	m6	K7	H7
	n6	J7	H7
	p6	H7	F7
Shrink fit	Customer's specification	on request	on request

Table 6.2. Combination of fits

## Attention !

**Observation of fit combinations is necessary, on the one hand, in order to keep the clearance in the shaft hub connection as low as possible, depending on utilization of the tolerance bands and, on the other hand, to limit hub stressing arising due to the interference within the permissible levels. Non-compliance may endanger the shaft-hub connection.**



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

### 6.1.1.1 Keyways

Keyways have to be machined to suit the existing keys. For keyways, the tolerance band of hub keyway width ISO JS 9 has to be kept to.

For heavy operating conditions, such as reversing- or shock load operation, the tolerance band of hub keyway width ISO P9 is specified.

### 6.1.2 Axial safeguarding

A setscrew or endplate can be used for axial safeguarding of coupling parts. If end plates are to be used, contact FLENDER GMBH with regard to the recessing of coupling parts.

### 6.1.3 Setscrews

To avoid damaging the shaft, the setscrew bore should be machined over the keyway.

Hubs of sizes 80 and 92, however, should have the setscrew located at 180 °C to the keyway.

Size	max. Thread mm	Size	max. Thread mm	Size	max. Thread mm
<b>80</b>	M5	<b>250</b>	M12	<b>520</b>	M24
<b>92</b>	M5	<b>270</b>	M12	<b>540</b>	M24
<b>102</b>	M6	<b>300</b>	M16	<b>560</b>	M24
<b>128</b>	M6	<b>320</b>	M16	<b>600</b>	M24
<b>145</b>	M8	<b>350</b>	M20	<b>620</b>	M24
<b>168</b>	M10	<b>370</b>	M20	<b>660</b>	M24
<b>180</b>	M10	<b>400</b>	M20	<b>690</b>	M24
<b>200</b>	M12	<b>440</b>	M24	<b>720</b>	M24
<b>205</b>	M12	<b>460</b>	M24	<b>740</b>	M24
<b>215</b>	M12	<b>480</b>	M24	<b>770</b>	M24
<b>235</b>	M12	<b>500</b>	M24	<b>820</b>	M24

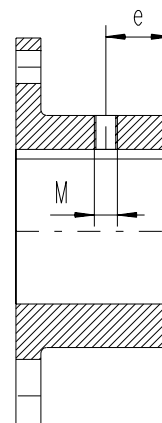


Table 6.3: Setscrew allocation

The following guide lines should be observed!

The setscrews are to be located at the centre of the hub core, as shown in above illustration. If this is not practical, please note that the clearance distance (**e**) to the set screw is to be at least  $M \times 1,5$ .

Hexagon socket set screws with cup point according to DIN 916 should be used.



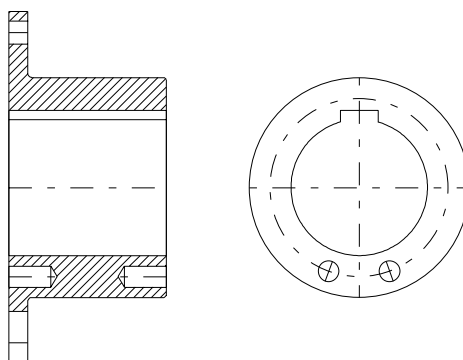
**The set screw length should fill the threaded hole but not project above the hub ( $L_{min} = M \times 1,2$ )**

## 6.1.4 Balancing

Rough drilled couplings resp. rough-drilled coupling parts are supplied in an unbalanced condition. For these components it is recommended that they are balanced, subject to their intended use, after finish boring (for this purpose, we refer to DIN 740, DIN ISO 1940 part 1).

Balancing is usually achieved by removing metal through drilling. In order to limit the material to be removed to a minimum, a rather large equalizing radius should be chosen.

Finish bored couplings or coupling parts are supplied in a balanced state according to customer's specification.



Arrangement of balancing holes when balancing in one plane.



## 6.2 General information on assembly

When assembling, the **safety instructions** of section 3 should be observed.

Assembly is to be carried out with great care by skilled fitters.

Care should be taken, already at the planning stage, that adequate space is available for assembly and subsequent maintenance work.

Adequate lifting gear should be on hand at the start of assembly.



**Under no circumstances can any sort of welding work be allowed on the coupling or coupling parts, as this will have a negative influence on the mechanical properties of the coupling.**

**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

## 6.3 Mounting of coupling parts (shaft-hub connection with key)

Prior to starting, finish bores and surfaces for spacer rings and nuts resp. close fitting bolts (subject to assembly procedure, see sect. 6.12) have to be thoroughly cleaned and rust protection removed. The same applies to shaftends.

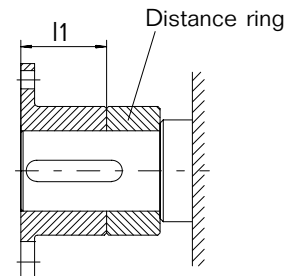


**Observe manufacturer's instructions regarding handling of solvents.**

### Attention !

**The coupling parts have to be mounted using suitable equipment, so as to avoid damaging any shaft bearings through axial mounting force. Use suitable lifting gear.**

Shaft ends should not protrude over hub inside faces. If necessary, place spacers or distance rings to bridge the gap between coupling and shaft shoulder. Axial safeguarding by setscrew or endplate.



### Attention !

**Tighten setscrews only with hex. key according to DIN 911, without extension pipe.**



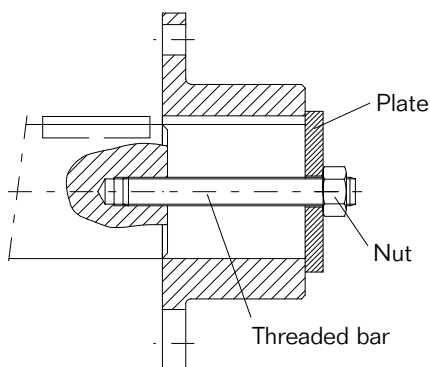
**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

For hubs with key connection it is recommended to warm the coupling hubs to max. 150 °C, this will facilitate mounting.



**Take care not to get burned by hot components.**

A mounting device will ease fitting hubs with transition fits and heated hubs on the lightly oiled shaft end.



Bar is threaded into shaft end; size of thread depends on available shaft diameter. Put a plate of appropriate size over the threaded bar. By tightening the nut the hub moves onto the shaft.

## 6.4 Disassembly of shaft-hub connection with key

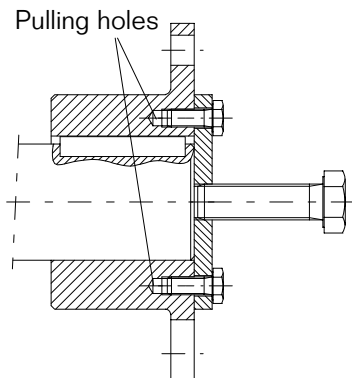
To pull a coupling hub from the shaft, the plate packs have to be disassembled first. Then remove the endplate if applicable resp. loosen setscrew. With the aid of a three-armed puller resp. by placing a pulling device in the threaded holes (only in existence if demanded), remove the hub from the shaft.

In case of a tight fit, warm the hub uniformly with a burner and carefully pull the hub with a pulling device from the shaft.

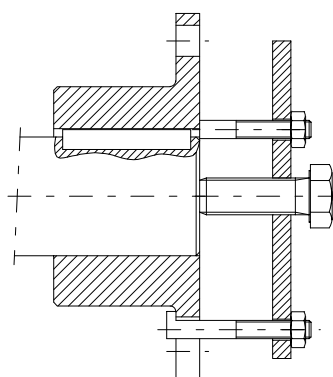


**Take care not to get burned by hot components!**

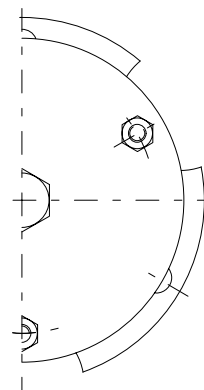
Check disassembled components carefully before reuse or return them, if necessary, to FLENDER GMBH for repairs.



**Hub with pulling holes**



**Three-arm puller**



## 6.5 Shrink connections

### 6.5.1 Assembly

Cylindrical shrink connections are joined by heating the outer part. To avoid premature binding, joining should be carried out speedily in a draught-free space.

Attention should be paid to a short transport distance!

#### 6.5.1.1 Mounting aids

- Hot air oven or ring burner
- Crane with rapid lowering facility (for vertical shaft)
- Cleaning agents, solvents, brushes, rags

## 6.5.1.2 Preparation for shrinking

- Parts should be visually checked  
Particularly noting the following points:
  - a) chamfer on shaft and hub bore
  - b) shrink fit surfaces without any damage
  - c) undamaged threaded connections for hydraulic implements.
- Remove preserving coat from parts to be joined with solvent



**Observe manufacturer's instructions regarding handling of solvents.**

- Check penetrability of oil channels and lengths of threads of thread connections.
- Heat hub uniformly to the specified temperature.



**Take care not to get burned by hot components!**

## 6.5.1.3 Shrinking process

- Preferred shaft position, if possible, is vertical.
- Locate heated hub without tilt, taking note of the leading-in chamfer.
- Lower hub without interruption down to the shoulder, taking care that no tilting occurs.
- Leave parts to cool slowly to room temperature, parts can be stressed after approx. 24 hours.



**Take care not to get burned by hot components!**

## 6.5.2 Disassembly of shrink connections

To disassemble a coupling hub with a cylindrical shrink fit, the plate packs and the spacer have to be disassembled first.

When disassembling in cold surroundings, the shrink connection should be slightly warmed up.

### 6.5.2.1 Ungraded shaft end

Depending on the length of the coupling hubs, there are 2 to 3 oil grooves. The oil must be pressed with the aid of 2 to 3 pumps into the shrink fit. The axial movement is realized with the help of a separate hydraulic press or mechanical puller.

### 6.5.2.2 Graded shaft end

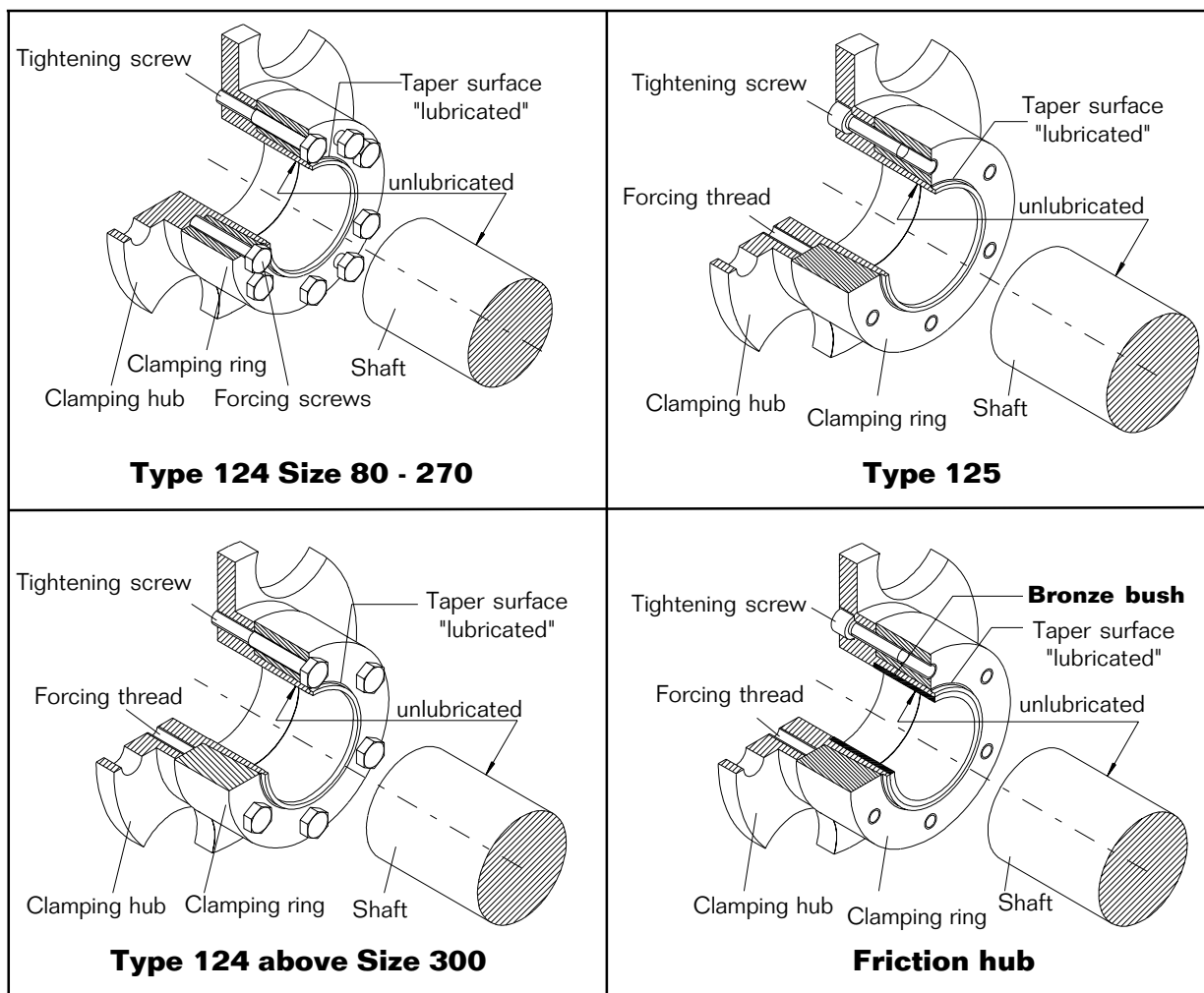
The coupling hubs are furnished with at least 3 oil grooves. A motor driven pump must be installed at the transition from the smaller to the bigger diameter of the shaft, because of the big amount of oil which is needed in short time. A hand-operated pump is sufficient for all other oil connections. The axial movement is caused by the pressure effect at the grade.

### 6.5.2.3 Viscosity of pressure oil

Under normal temperature conditions thin-bodied, pure mineral oil with a viscosity of 6 to 10°E at 50°C serves best as pressure oil.

However, should oil escape in masses, so that the pressure cannot be held, the use of more heavy-bodied oil is possible.

## **6.6 Clamping hub connection (type 124/125 and sliding hubs)**



### **6.6.1 Preliminary remarks**

Power transmission of ARPEX-clamping and sliding hubs is by frictional engagement. ARPEX sliding hubs are supplied with the specified torque adjusted, it is for this reason, that they should not be disassembled. Clamping hubs are shipped in assembled condition, ready for mounting.

### **6.6.2 Assembly**

Note the following procedure on assembly:

- a) Degrease shaft and hub bore.



**Observe manufacturer's instructions regarding handling of solvents.**

- b) Loosen clamping screws slightly and pull clamping ring just a fraction off the hub, so that the clamping ring is loose.
- c) Push hub on shaft.
- d) Tighten clamping screws evenly one after the other. Several turns must be made, until the clamping ring fits snugly and evenly on the flange of the clamping hub. The clamp connection is ready for use, when the tightening torque for clamping screws, listed in table 6.4, has been reached and the clamping ring sits close against the hub flange.

**Attention !**

**Non-observance of these recommendations can impair the function of the clamping- resp. sliding hub.**

# FLENDER

Tightening torque - clamping screws Quality class 10.9 ( $\mu$ 0,14)					
Thread	TA [Nm]	Thread	TA [Nm]	Thread	TA [Nm]
M5	8,9	M12	130,0	M20	620,0
M6	15,5	M14	205,0	M24	1060,0
M8	37,0	M16	310,0		
M10	75,0	M18	430,0		

Table 6.4: Tightening torques of screws for clamping hubs

## 6.6.3 Disassembly

Procedure for disassembly of clamping hubs:

### 6.6.3.1 Clamping hubs size 80 to 270 and sliding hubs

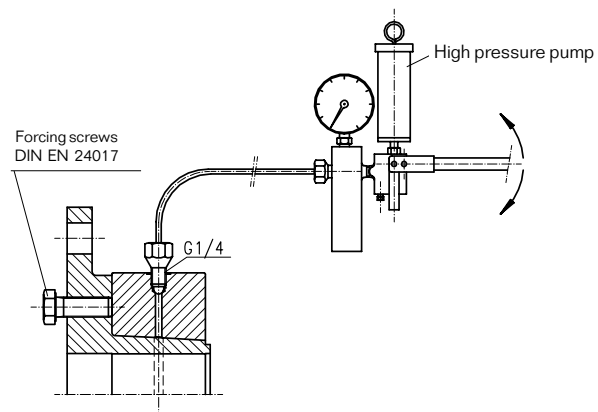
- a) Loosen clamping screws evenly one after the other. Each screw should only be loosened by half a revolution per rotation. Free all clamping screws by 3-4 threads.
- b1) Clamping hub "124"  
Loosen clamping ring with the aid of forcing screws, located in the clamping ring. Before mounting the clamping ring again, screw back the forcing screws to their original position.
- b2) Clamping hub "Type 125" and sliding hub  
Loosen the clamping ring by tightening screws in the forcing threads of the hub flange (see type 125). Before mounting the clamping ring again, remove screws.

### 6.6.3.2 Clamping hubs from size 300 up

- a) Loosen clamping screws evenly one after the other. Each screw should only be loosened by half a revolution per rotation. Free all clamping screws by 3-4 threads.
- b) In case the clamping ring does not automatically come loose from the hub, additional forcing screws, depending on number of threaded holes (subject to size of coupling), have to be used on the ARPEX flange and evenly tightened, until the clamping ring comes loose.

- c) If this procedure is not successful, oil has to be forced into the parting line between clamping ring and hub by high pressure pump; to remove thus the self blocking of the clamping ring. For this purpose the high pressure hose of the pump is connected via the G 1/4" connecting thread on the outside diameter with the clamping ring.

Before retightening the clamping ring remove the forcing screws and close the G 1/4" threaded hole with the plug, supplied as part of the shipment.



**Attention !**

**Non-observance of these recommendations can impair the function of the clamping resp. sliding hub.**

## 6.6.4 Cleaning and lubrication

If the clamping ring has been removed hydraulically, then the taper surfaces have to be cleaned to remove the hydraulic oil and greased again with Altemp Q NB 50 (Messrs. Klüber).



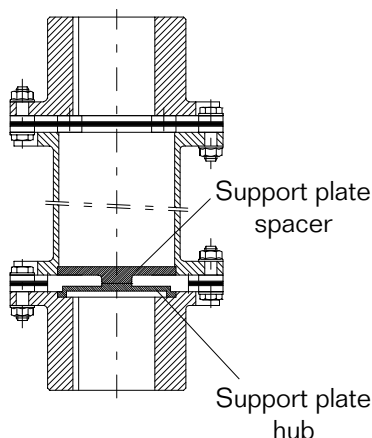
**Observe manufacturer's instructions regarding handling of solvents.**

Otherwise the dismantled clamping hub connection does not have to be further disassembled and regreased before retightening. But in case the cone faces are to be greased again, the above named lubricant should be used.

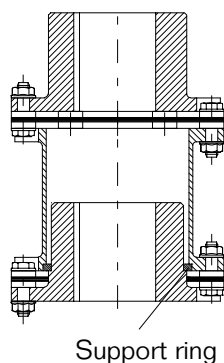
## 6.7 V-supports

Plate packs of ARPEX couplings are axially flexible and thus cannot support the weight of a spacer in a vertical application. Support plates are optionally available, which direct the spacer weight as an axial thrust force to the machine bearing, without straining the plate pack. For applications of this type, spacers and connecting pieces are fitted, fully functional, at the factory. The support plates are adapted and fitted to suit the coupling combination.

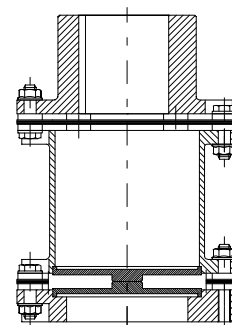
NHN with V-support



BEN with V-support



CEN with V-support



### 6.7.1 Assembly

On assembling an N-hub resp. B-hub, the factory fitted support plate has to be removed, by unscrewing the three studscrews with an Allan key. The hub is then mounted on the shaft end as described in section 6.3.

After mounting, reassemble the support plate in the hub, locate it properly and screw in the three studscrews. Take care that the support plate seating is flat.



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

Now the plate pack is positioned on the hub face and the spacer with the factory fitted support plate is located on the lower support plate; after this, the second plate pack and close fitting bolts are inserted and assembled (see section 6.12).

### 6.7.2 Disassembly

Remove spacer and plate packs in reverse order. Unscrew the three studscrews and with two forcing screws in the support plate, lift it out of the recess. When replacing plate packs, check the V-support plates and renew them if necessary.

## 6.8 U-spacers

ARPEX couplings series K 430 are optionally available with a U-spacer from size 145 up. The dimensions of U-spacers correspond with those of E-spacers, but can be parted in the centre.

### 6.8.1 Condition on delivery

U-spacers are supplied in hand-screwed assembled condition.

### 6.8.2 Assembly

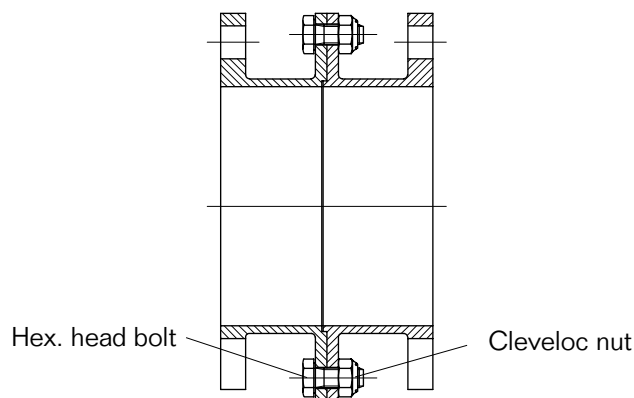
Before assembly clean the coupling parts carefully using a suitable cleaning agent.



**Observe manufacturer's instructions regarding handling of solvents.**

Internal and external recesses and contact surfaces of individual U-spacer components have to be checked for possible damage and reworked if necessary. Before inserting the bolts, look for possible balancing markings (sect. 6.10).

Tighten the bolts evenly one after the other with the specified torque (see table 6.5), being careful that the recess connection is not tilted.



**Attention !**

**Non-observance of these instructions can impair the proper function of the coupling.**

## 6.9 C-, D- and F-flange fastening

### 6.9.1 Condition on delivery

C-, D- or F- flanges are supplied, subject to agreement, as single parts or ready assembled with a spacer.

### 6.9.2 Assembly

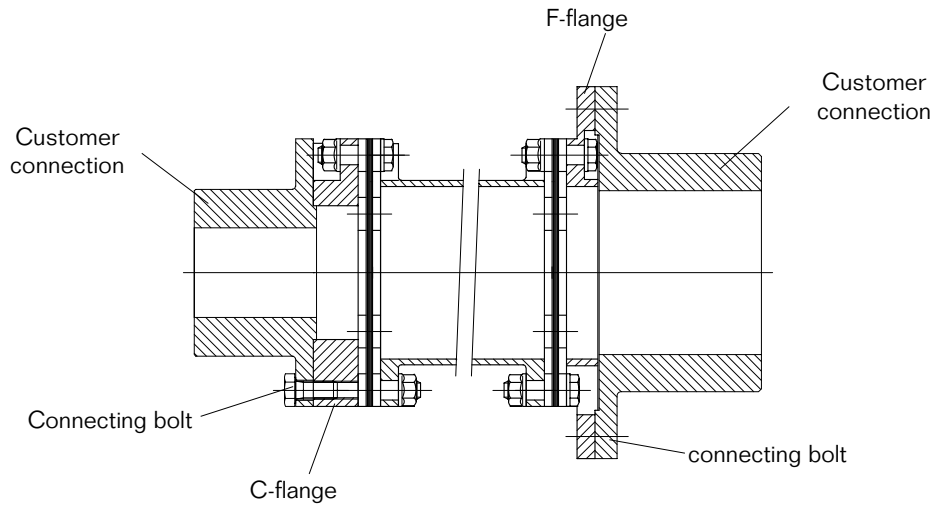
Before assembling, clean coupling parts carefully with the help of a suitable solvent.



**Observe manufacturer's instructions regarding handling of solvents.**

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- Check recesses and contact faces of C-, D- or F-flanges for possible damage and rework them if necessary.
- Take great care in making recess connections.
- The connecting bolts have to be tightened evenly one after the other with the specified torque (see table 6.5), being careful that the recess connection is not tilted.



**Attention !** Non-observance of these instructions can impair the proper function of the coupling.

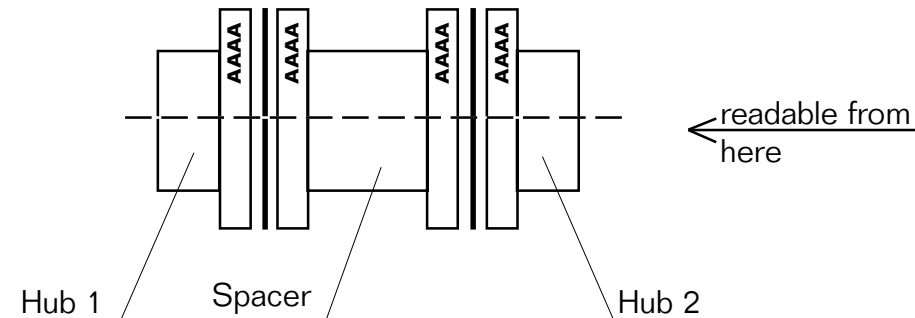
Hex. bolt DIN EN 24017 / 8.8	Tightening torque
M6	10,4 Nm
M8	25 Nm
M10	51 Nm
M12	87 Nm
M16	215 Nm
M20	430 Nm
M24	740 Nm
M30	1500 Nm
M36	2600 Nm
M42	4000 Nm
M48	6000 Nm
M56	9600 Nm

Table 6.5: Tightening torques of connecting bolts



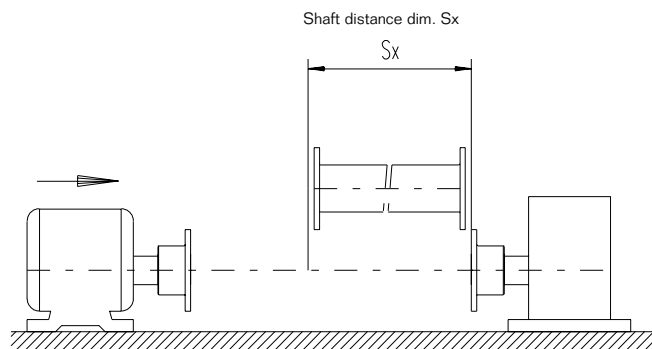
## 6.10 Assembly of summation balanced couplings

Couplings which are summation balanced, have a 4-digit number stamped on each component flange OD. Take care on assembly, that only coupling parts are bolted together which have the same numbers on their flange OD. The components have to be arranged so that numbers are in one line, to be readable from one direction (see illustration). Only this arrangement guarantees the requirements.



## 6.11 Assembly of the drive train

Move machines to be coupled to the specified shaft distance dimension.



**Take care, danger of bruising!**

## 6.12 Fitting the plate packs

### 6.12.1 Size 80 to 270

Assembly of plate packs is carried out, depending on size, according to illustrations on page 27. On couplings furnished with O-spacers, F-flange and special designs with restricted space requirement, close fitting bolts can be assembled mirror inverted.

Plate packs have to be bolted to the coupling part, so that rings (1) are adjacent to ARPEX flange (2).

Application of the preloading force has to be from the nut side, whereby the bolt head should be secured against rotating. Support of the safeguard against rotating (resp. counter holder) has to be on the flange, with which the plate pack is being bolted up. Tighten nuts one after the other with torques listed in table 6.6.



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

### 6.12.2 Sizes 300 to 820

In principle, the same procedures apply as for sizes 80 to 270 (see 6.12.1)

In addition, the following should be noted:

Before assembly, grease all threads of close fitting bolts as well as collar faces of nuts and bolt heads with the special ATEC paste (Klüber Altemp Q NB 50) supplied.

Pretension is determined by strain gauge. For this purpose, the length of bolts must be measured precisely before tightening, and constantly compared with values of table 6.6 during the tightening procedure, until they have been reached (see also illustration 4 on page 27).



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

### 6.12.3 Plate packs with integral axial float limitation

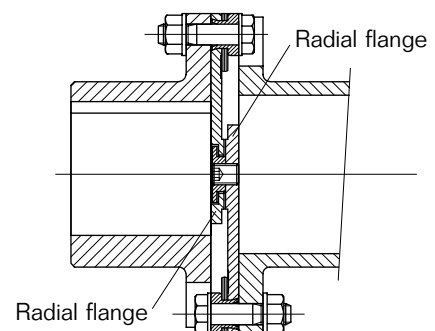
Here, also, the same procedure applies as for sizes 80 to 270 (see section 6.12.1).

In addition, the following should be noted:

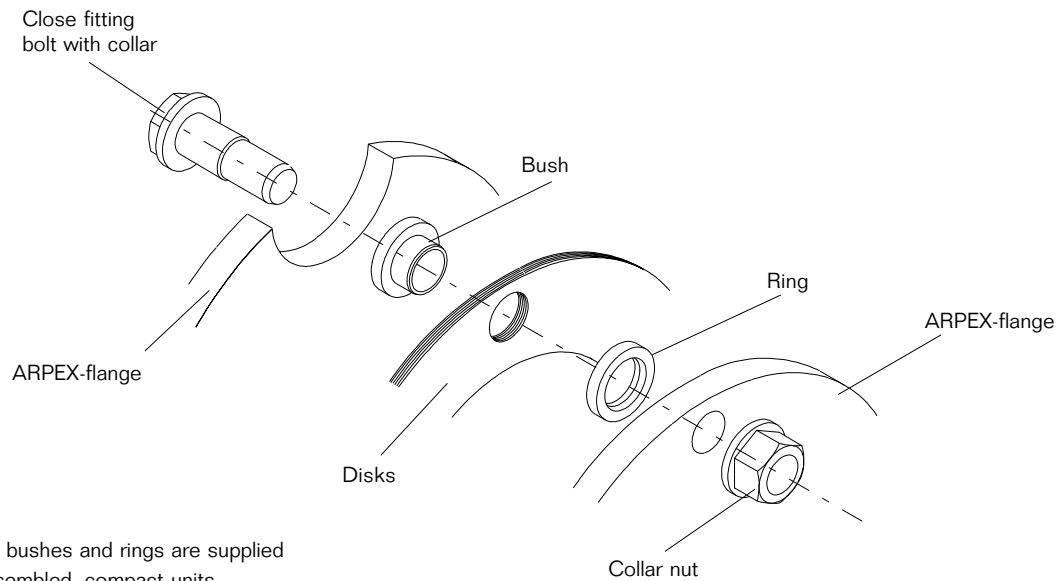
The plate pack has to be fastened to the coupling parts such that the radial flange of the plate pack sits close to the flange of the coupling part, as otherwise the proper function of the coupling cannot be guaranteed.

**Attention !**

**Non-observance of these instructions can impair the proper function of the coupling.**



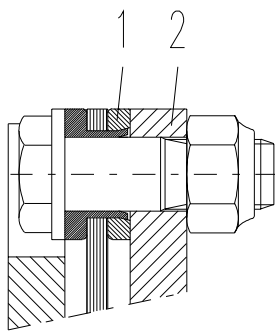
## Design of an ARPEX bolting point



### Note!

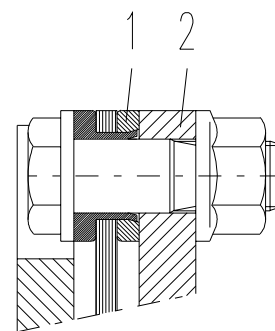
Plate packs, bushes and rings are supplied as ready assembled, compact units.

1.



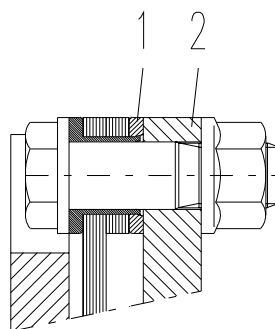
**Plate pack Sizes 80 - 145  
(Ring plate pack, Cleveloc nut)**

2.



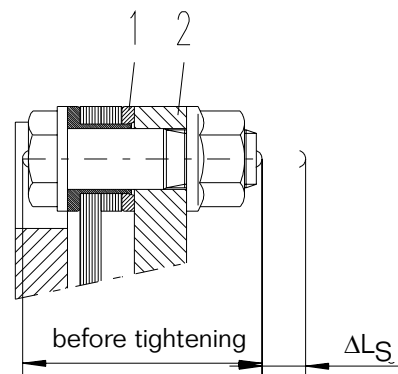
**Plate pack Sizes 168 - 200  
(Ring plate pack, collar nut)**

3.



**Plate pack Sizes 205 - 270  
(Hex. plate pack, collar nut)**

4.



**Plate pack sizes 300 - 820  
(Hex. plate pack, fitting bolt with  
defined measuring points (ball),  
collar nut)**

## 6.13 Technical data for plate pack assembly

ARPEX Size K430	Thread [mm]	SW * [mm]	Tightening torque $T_A$ [Nm]	Elongation $\Delta L_s$ [mm]	Remarks
80 92 102	M6	10	10	-	Pretensioning by tightening torque $T_A$ [Nm]
128 145	M8	13	25	-	
168	M10	17	55	-	
180	M12	19	95	-	
200 205 215	M16	24	240	-	
235 250 270	M20	30	460	-	
300 320	M24	36	(820)	0,14 - 0,16	Pretensioning by elongation
350 370 400	M30	46	(1650)	0,17 - 0,19	
440 460 480 500	M36	55	(3000)	0,22 - 0,24	
520 540 560	M42	65	(4800)	0,27 - 0,30	
600 620 660 690	M48	75	(7400)	0,31 - 0,34	
720 740 770 820	M56	85	(11600)	0,36 - 0,39	

\*SW = width across flats

Table 6.6: Tightening torques and elongation values for plate pack fastening

### Attention !

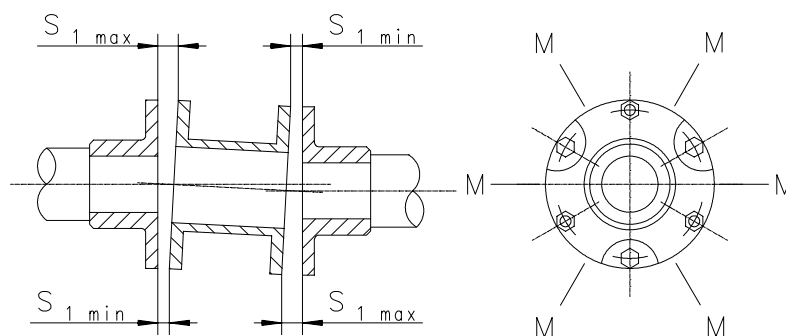
**Tightening torques  $T_A$  for sizes 300 to 820 are only approx. values. Decisive factor for pretensioning is the elongation ( $\Delta L_s$ ).**

## 6.14 Alignment

The couplings can compensate for misalignment of shafts to be connected up to the data listed in 6.15. The radial and angular misalignments of shaft ends is to be kept as small as possible.

Couplings featuring two plate packs can accommodate axial, radial and angular misalignments. Couplings with only one plate pack, accept just angular and axial misalignment.

On aligning machine parts, use a caliper gauge to measure gap  $S_1$  (see illustration) between coupling flanges at several measuring points. If the measured flange gaps are within the value range  $S_{1\min}$   $S_{1\max}$  (see table 6.7), then the alignment is sufficiently good.



- $S_1$  = Gap of coupling flanges
- $S_{1\min}$  = see table
- $S_{1\max}$  = see table
- M = Measuring point

### Attention !

The assembly misalignment values must not exceed values for  $S_{1\min}$  and  $S_{1\max}$  (table 6.7). In order to have misalignment reserves for the operating process, it is advisable to align the couplings such that the assembly misalignment is smaller than stated below (see also sect. 6.15).

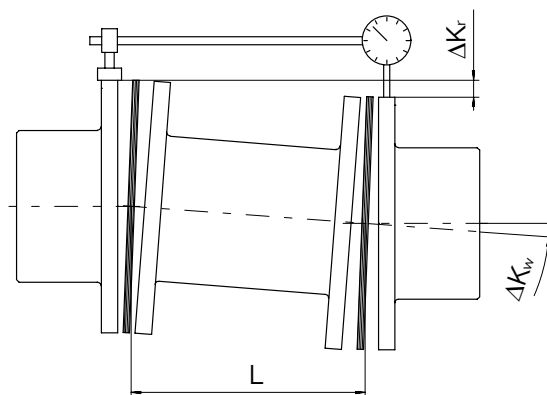
Größe	$S_1$ min. mm	$S_1$ max. mm	Größe	$S_1$ min. mm	$S_1$ max. mm	Größe	$S_1$ min. mm	$S_1$ max. mm
80	7,7	8,3	250	22,5	23,5	520	43,1	44,9
92	7,7	8,3	270	22,5	23,5	540	43,1	44,9
102	7,7	8,3	300	26,4	27,6	560	43,1	44,9
128	10,5	11,5	320	26,4	27,6	600	49,0	51,0
145	10,5	11,5	350	31,3	32,7	620	49,0	51,0
168	13,4	14,6	370	31,3	32,7	660	49,0	51,0
180	14,4	15,6	400	31,3	32,7	690	49,0	51,0
200	14,3	15,7	440	37,2	38,8	720	58,8	61,2
205	19,6	20,4	460	37,2	38,8	740	58,8	61,2
215	19,6	20,4	480	37,2	38,8	770	58,8	61,2
235	22,5	23,5	500	37,2	38,8	820	58,8	61,2

Table 6.7: Permissible assembly misalignment

## 6.15 Possible misalignments

Misalignments of coupling parts relative to each other can occur from inaccurate alignment on installation or can be caused by operating factors (heat extension, shaft bending, machine frame too weak etc.).

Radial misalignment  $\Delta K_r$  / Angular misalignment  $\Delta K_w$



Axial misalignment  $\Delta K_a$

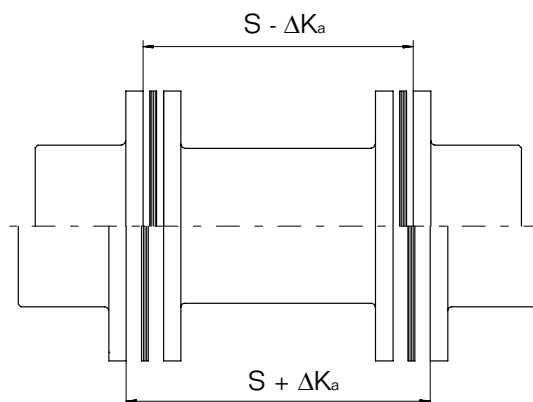


Table 6.8 lists perm. misalignments in angular and at the same time, axial direction, whereby values for axial misalignment refer to 1 plate pack.

The listed values are the total allowable misalignments which are allowed to occur during operation; misalignments which occurs during the assembly process must be considered appropriately.

Permissible radial misalignment depends on the allowable angular misalignment and on centre distance of plate packs.

$$\Delta K_r = \tan \Delta K_w \times L$$

$L$  = centre distance of plate packs

$L = S_8 - S_1$

### Example for finding the permissible misalignment:

Required:

Perm. misalignment values for an ARPEX coupling type NHN 180 with a shaft distance of  $S_8 = 1000$  mm.

- Allow. angular misalignment =  $0,7^\circ$  at  $\Delta K_a = 0$  mm  
Allow. axial offset =  $\pm 2,98$  mm (2 plate packs =  $2 \times 1,49$  mm) at  $\Delta K_w = 0^\circ$
- Allow. axial misalignment at  $\Delta K_w = 0,3^\circ = \pm 1,7$  mm (2 plate packs =  $2 \times 0,85$  mm)

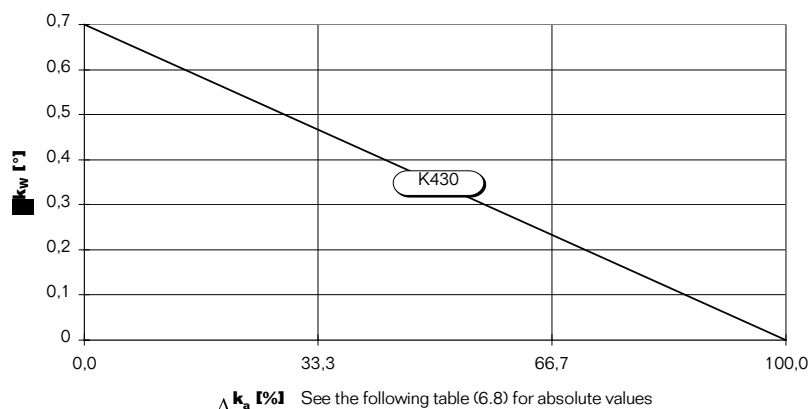
The corresponding allow. radial misalignment at an angular misalignment of  $0.3^\circ$  is calculated as follows:

Centre distance of plate packs  $L = S_8 - S_1$   
=  $1000$  mm -  $15$  mm =  $985$  mm

$$\Delta K_r = \tan (0,3^\circ) \times 985 \text{ mm} = 5,15 \text{ mm}$$

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## 6.15.1 Perm. total misalignment, subject to axial- and angular misalignment.



**Attention !**

The following max. permissible misalignment values must not, under any circumstances, be exceeded during operation.



Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!

## 6.15.2 Axial- /angular misalignment

The listed axial misalignment must be understood as permissible tolerance values according to the S1-value (see table 1.1.2).

Size [mm]	Permissible axial misalignment $\Delta K_a$ [mm]							
	0,58	0,49	0,41	0,33	0,25	0,16	0,08	0,00
80	0,58	0,49	0,41	0,33	0,25	0,16	0,08	0,00
92	0,73	0,63	0,52	0,42	0,31	0,21	0,10	0,00
102	0,86	0,74	0,62	0,49	0,37	0,25	0,12	0,00
128	1,05	0,90	0,75	0,60	0,45	0,30	0,15	0,00
145	1,27	1,09	0,91	0,73	0,54	0,36	0,18	0,00
168	1,41	1,21	1,01	0,81	0,61	0,40	0,20	0,00
180	1,49	1,28	1,07	0,85	0,64	0,43	0,21	0,00
200	1,44	1,23	1,03	0,82	0,62	0,41	0,21	0,00
205	1,51	1,29	1,08	0,86	0,65	0,43	0,22	0,00
215	1,64	1,40	1,17	0,94	0,70	0,47	0,23	0,00
235	1,66	1,43	1,19	0,95	0,71	0,48	0,24	0,00
250	1,86	1,59	1,33	1,06	0,80	0,53	0,27	0,00
270	2,12	1,82	1,52	1,21	0,91	0,61	0,30	0,00
300	2,09	1,80	1,50	1,20	0,90	0,60	0,30	0,00
320	2,36	2,02	1,68	1,35	1,01	0,67	0,34	0,00
350	2,23	1,91	1,59	1,27	0,95	0,64	0,32	0,00
370	2,49	2,13	1,78	1,42	1,07	0,71	0,36	0,00
400	2,88	2,47	2,06	1,65	1,23	0,82	0,41	0,00
440	3,01	2,58	2,15	1,72	1,29	0,86	0,43	0,00
460	3,27	2,81	2,34	1,87	1,40	0,94	0,47	0,00
480	3,54	3,03	2,53	2,02	1,52	1,01	0,51	0,00
500	3,80	3,25	2,71	2,17	1,63	1,08	0,54	0,00
520	3,67	3,14	2,62	2,09	1,57	1,05	0,52	0,00
540	3,93	3,37	2,81	2,24	1,68	1,12	0,56	0,00
560	4,19	3,59	2,99	2,39	1,80	1,20	0,60	0,00
600	4,12	3,54	2,95	2,36	1,77	1,18	0,59	0,00
620	4,39	3,76	3,13	2,51	1,88	1,25	0,63	0,00
660	4,91	4,21	3,51	2,81	2,10	1,40	0,70	0,00
690	5,30	4,55	3,79	3,03	2,27	1,52	0,76	0,00
720	5,11	4,38	3,65	2,92	2,19	1,46	0,73	0,00
740	5,37	4,60	3,83	3,07	2,30	1,53	0,77	0,00
770	5,76	4,94	4,11	3,29	2,47	1,65	0,82	0,00
820	6,42	5,50	4,58	3,67	2,75	1,83	0,92	0,00
	0,0°	0,1°	0,2°	0,3°	0,4°	0,5°	0,6°	0,7°
	Permissible angular misalignment [°] $\Delta K_w$							

Values are valid for 1 plate pack!

Table 6.8: Permissible axial and angular misalignment

## 7. Putting into service

### 7.1 Before operating

Check all bolt connections and retighten them if necessary. Alignment and gap dimension S1 should also be checked and corrected if necessary (see table 6.7 and 6.8). **Then mount the coupling guard, protection against unintentional contact.**



**Disregarding these notes can cause damage to the coupling. Flying metal fragments can cause serious personal injuries!**

## 8. Operation

### 8.1 General operating data

During operation, pay attention to

- changing running noises
- suddenly occurring vibrations.

#### **Attention !**

**In case any irregularities are noticed during operation, the drive must be stopped at once. Determine the cause of trouble with the aid of the trouble-shooting check list (sect. 9) which features possible sources, their causes and proposals to eliminate them. In case, the cause cannot be found resp. if there is no possibility to remedy the trouble with own resources, we recommend calling for a service engineer from one of our service depots (sect. 11).**

## 9. Failures, causes and remedies

### 9.1 General

The following listed failures can only be clues in the search for any cause of faults.

In complex drive situations, all other components have to be included in the search.

During all operating phases, the coupling should run with low noise and without vibration. Different operating behaviour should be seen as a fault, which has to be remedied promptly.



**Before beginning any maintenance activities, repairs or other work, the operator has to ensure that the complete drive has stopped. The driver has to be secured against unintentional starting; otherwise we refer to the particular health and safety requirements for the installation.**



## 9.2 Possible failures

Failure	Possible cause	Remedy
Sudden change in noise level and/or suddenly occurring vibrations	Change in alignment	Stop drive  Remedy reason for change in alignment (e.g. tighten loose foundation bolts)  Check for wear; proceed as described in sect. 10
	Broken plate pack, transmission of torque by close fitting bolts	Stop drive  Disassemble coupling and remove remainder of plate pack  Check coupling components and replace damaged parts  Check alignment and correct it, if necessary

Table 9.1 : Possible failures

## 10. Maintenance

### 10.1 General

ARPEX couplings should be visually checked corresponding to the maintenance schedules of the plant, but at least once a year. Special attention is to be paid to the condition of the plate packs. Should individual plates or whole strands be broken, then the particular plate pack has to be replaced; in these cases, check also the coupling flanges for damage.

Any further maintenance work is not necessary.

### 10.2 Replacing plate packs

Original ARPEX plate packs should only be used as replacement, to guarantee proper torque transmission and trouble-free function.

**Note! As a rule, replacing plate packs is possible without the necessity to shift coupled drive members. Exceptions are combinations with B-hubs.**

For reassembly, carefully note instructions of section 6 "Assembly" and section 7 "Putting into service".

## 11. Stocking of spare parts, addresses of service centres

Storage of important spare and wearing parts at the site is an essential requirement for operational availability of the coupling.

When ordering spare parts, the following data has to be given:

**Number of pieces, name of parts, size** (provided it is available, state also DRG. no. and position of spare part on the spare parts list.)

If coupling parts are required with finish bore and balanced, specify the following:

**Finish bore, fit, keyway and balancing quality**

**Example of an order:** 1 pc. ARPEX hub, series K430, size 250 with bore 70 H 7 and keyway to DIN 6885-1, single part dynamically balanced G 2.5, speed 1000 rpm

1pc. ARPEX plate pack, series K430, size 250 complete.

We can only guarantee original spare parts supplied by us.

**Attention !**

**We expressly draw client's attention to the fact that spare parts and accessories not supplied by us, have not been checked and released by us. Their assembly and/or use can possibly alter design characteristics negatively and thereby impair the active and/or passive safety. FLENDER GMBH excludes any liability and guarantees for any damage which results from the use of non-original spare parts and accessories.**

Please note that for individual components special manufacturing and supply specifications frequently exist and that we always offer spare parts according to the state of technology and latest legal requirements.

### 11.1 Addresses of service centres

When requesting spare parts or service fitter, contact FLENDER GMBH first.

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